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22. *NEOCONOCEPHALUS* SPP. A LONG HORNED GRASSHOPPER (TETTIGONIIDAE: ORTHOPTERA) FEED ON SMALL BLACK ANT

On 1st, September 1995 I was in the garden collecting insect pests of a bean vegetable. It was around 4.30 p.m., that I found a long horned grasshopper *Neoconocephalus* spp., family Tettigoniidae, descriptive and pictographic identification from Imms (1965), lifting one hind leg, on whose tarsus a black ant was biting. The reason for the biting could not be known. The hopper jerked its leg up and down due to the pain of the bite, tried to free itself from the ant, but could not. Suddenly it brought the tarsal portion of the hind leg on which the ant was biting, below its body to the mouth. The hopper caught the ant with its mandibles and ate it up completely within a moment.

M.S. Mani (1982) states that Tettigoniids are mostly diurnal forms that are usually herbivorous. And hence the above mentioned feeding behaviour is unusual.

During my study on insect pests of bean, predatory behaviour of the the long horned grasshopper on ants has not been observed. However, the above observation indicates that under compelling circumstances, a long horned grasshopper can feed on small black ants. This behaviour needs further observation.

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23. ARE ANTS SECONDARY DISPERSERS OF FIG SEEDS IN INDIAN FORESTS?

Apart from vertebrates, which are major dispersers of seeds, several invertebrates are also known to assist in the dispersal. Beetles, earthworms, snails and ants are known to disperse seeds which may even lead to the rearrangement of the seed shadow (Beattie and Culver 1982, Roberts and Heithaus 1986). Studies have shown that fig seeds are regularly subjected to secondary dispersal by ants which harvest the lipid-containing exocarp (elaisome) of the small fig seeds (Roberts and Heithaus 1986, Kaufmann *et al.* 1991). Despite the richness of *Ficus* species in the Indian subcontinent, information on this aspect of its seed dispersal is lacking.

While studying several aspects of fig ecology (Athreya 1993) in Karian Shola National Park, Indira Gandhi Wildlife Sanctuary, Western Ghats, I came across several indications that the secondary dispersal of *Ficus* seeds by ants may occur even in Indian forests. The vegetation of this area is dominated by the west-coast tropical evergreen forest type of Champion and Seth (1968) with *Hopea parviflora* and *Messua ferrea* being the characteristic tree species. *Ficus* trees are quite common within the National Park, especially in relatively open areas (unpubl. data).

I came across armies of ants carrying away fig seeds from fallen fruits and droppings of frugivores

from under trees of *F. microcarpa* and *F. drupacea* (both strangler figs). This was also noticed for the fig seeds which formed a major fraction of the copious droppings of Great Pied Hornbills (*Buceros bicornis*) below their nest-holes.

I also split open some ripe figs of *F. exasperata* (free-living *Ficus*) and *F. drupacea* and placed them at my camp site. The same evening I saw ants carrying away the seeds from all the figs, although the seeds of *F. exasperata* seemed to be less popular. However, both species of figs were devoid of seeds by the next morning.

It has been said elsewhere that the lipid-containing exocarp is not affected by the passage through the vertebrate gut and is still harvested by the ants (Kaufmann *et al.* 1991). Ants are known to be responsible for *Ficus* seedlings taking root in crevices in vertical surfaces (Kaufmann *et al.* 1991).

This system of secondary dispersal of fig seeds by ants has not been studied in any Indian forest. Although this note is of a qualitative nature, a detailed study of this aspect may throw some light on the importance of the role played by invertebrates in affecting the seed shadow of figs, especially strangler figs, which require specific microhabitats for successful germination (Putz and Holbrook 1986).

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24. THE SPOT PUFFIN BUTTERFLY *APPIAS LALAGE LALAGE* DOUBLEDAY (PIERIDAE) - A RARE RECORD FOR SOUTH INDIA

The butterfly *Appias lalage lalage* has been recorded in the United Provinces, Mussooree to Burma, Tavoy (Talbot 1939). Its range is also mentioned from Simla to Burma and Assam by Wynter-Blyth (1957). D'Abrera (1982) states its range as Assam to upper Burma and Antram (1924) noted it as a rare species recorded from the Himalayas, Sikkim, Bhutan and Assam. The only record found from South India was at the Netterikkal region of the Kalakkad forest, Tiruneveli District, Tamil Nadu (Satyamurti 1966).

A single male specimen of the wet season form with a wingspan of 76mm was taken in Gudampara Estate, Santhanpara panchayat, Idukki District, Kerala at an elevation of 1200 m above msl on December, 3, 1995. The butterfly was mudpuddling at noon near a small stream flowing through a coffee plantation.

It appears to be one of the few records of the Spot Puffin from South India and may be the first record from Kerala. This shows that this butterfly though rare, does exist in the Western Ghats apart from its known range. The specimen is now in the Gudampara Biopark Project collection.

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